Treatment and management of cervical incompetence in the pregnant and non-pregnant mare

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Introduction

Identification of cervical abnormalities is important because these defects are invariably associated with sub-fertility or even sterility.
Congenital abnormalities and traumatic injuries to the cervix may preclude timely dilation and/or closure and prevent its role as a selective valve, leading to cervical incompetence. The inability of the cervix to relax appropriately during estrus has been addressed elsewhere in these proceedings. Cervical incompetence is commonly associated with difficulty conceiving or carrying a foal to term. In humans, cervical incompetence is of major concern [1] and can result in late term abortions, similar to observations in mares. A variety of techniques have been employed in human medicine including medical therapy with progestagens, cervical cerclage [2] and the placement of a cervical pessary [3], some of which may be applicable in the mare.

Anatomical Cervical Incompetence

Cervical pathology is widely recognized as a major cause of pregnancy failure in the mare. Traumatic, anatomical disruption of the cervical canal may occur at foaling, mostly during uncomplicated births. Cervical incompetence will usually result from severe and/or repeated traumatic insults to the cervix and the inability to form an adequate seal may compromise fertility. Surgical cervical repair is often long-term ineffective, as more severe tears may result from subsequent deliveries. A compromised cervical seal is a predisposing factor to chronic endometritis and ascending placentitis, and supports conditions as pneumometra, urometra and infectious endometritis, particularly when associated with a defective caudal reproductive tract.
Diagnosis of cervical lacerations may be challenging. Most cervical lacerations are best evaluated in diestrus, as the increased cervical tone facilitates assessment of the apposition of cervical folds and damage to the muscular layer. Digital palpation is essential for accurate diagnosis and aims at identifying both longitudinal and circumferential defects of the cervical canal. Complete and incomplete defects are recognized, according to the mucosal layer involvement. Multiple cervical lesions are uncommon and no predisposing site for tearing can be identified.

Surgical Repair

Not all cervical lacerations require surgical repair [4,5]. Under the influence of progesterone the cervix reduces in size, while smooth muscular tone increases. As a result, small tears may be of little clinical significance. Brown et al (1984) [6] suggested that only tears involving 50% or more of the vaginal cervix require surgical correction. Mare's reproductive history and clinician's experience are two additional factors to be taken into account. In addition, the rest of the reproductive tract should be critically evaluated to exclude other potential causes of infertility, including evaluation of endometrial biopsies in mares that have been barren for some time. Mares that sustain complete overstretching of the cervical canal, with extensive disruption of the fibromuscular layer are not good candidates for surgical repair.
Surgical repair should be carried out in diestrus and at least 30 days after recent cervical injury. Four to six weeks of postoperative sexual rest should follow, to allow for

complete healing and contraction. On alternative, surgery maybe carried out after breeding, 2-3 days after ovulation.

Surgical Technique

Cervical repair is usually carried out in the sedated, standing mare, restrained in stocks, with the aid of local anesthesia, infused deeply into the vaginal tissue, around the cervical site to be repaired. Epidural anesthesia may be required in mares straining excessively and occasionally cervical surgery will be performed under general anesthesia. Mares are usually treated peri-operatively with systemic antimicrobials, non-steroidal anti-inflammatory drugs (NSAID) and tetanus prophylaxis. The perineum is aseptically prepared and the tail bandaged. To obtain adequate exposure modified Finochietto retractors are used, with elongated blades (>25cm), to reach cranially over the vestibulo-vaginal junction. The cervix is retracted with Knowles forceps or stay sutures (#2 polyglactin 910), and Allis forceps. Long-handled instruments are nonetheless required, as the surgery is performed in the depth of the tubular tract and a good light source is essential.

Three techniques have been described for closure of cervical defects: three-, two-and one-layer closure [7]. The one-layer closure is technically less demanding and can be accomplished more quickly and used at any time, according to McKinnon (personal communication). It involves a simple continuous pattern passed through the outer cervical mucosa and into the muscular layer.

Occasionally cervical damage is beyond repair. Under these circumstances the placement of a cervical cerclage suture maybe be the only alternative to restore cervical competence and maintain pregnancy to term.

Functional Cervical Incompetence

Identification of untimely cervical relaxation through serial vaginoscopy or intravaginal palpation poses serious risks to the integrity of the pregnant cervical seal and transrectal palpation, although safe, is less informative. Sonographic cervical length measurement has emerged as an effective prognosticator of preterm delivery in women and extensive research has been made in the past 15 years on the ultrasonographic (US) assessment of the pregnant cervix [8]. A recent study on the US assessment of the pregnant equine cervix under physiological conditions demonstrated progressive changes occurring throughout gestation [9]. The study reported on the safety and non-invasiveness of ultrasonography to assess cervical relaxation, suggesting very little change in cervical size, tone and echotexture occurring up to nine months gestation in normal equine pregnancies. Cervical changes indicating progressive relaxation were consistently observed during the last two months gestation, with gradual palpable shortening and softening of the cervix.

Management of Functional Cervical Incompetence

Detection of signs of untimely cervical relaxation, with or without allantochorial chnges, allows for early therapeutic intervention and resolution of clinical signs. Mares carrying a history of ascending placentitis are good candidates for elective US examination of the cervix, as the condition may recur. Transrectal scans should take place at 3-4 weeks intervals, throughout gestation. Mares suffering from chronic medical conditions, endocrine imbalances and toxic disorders have been observed to show US evidence of premature cervical relaxation, even under progestagen supplementation (personal communication). Cervical cerclage represents an effective means of maintaining cervical closure during pregnancy [10], when adequate cervical tone cannot be achieved by progestagen administration alone. The application of a purse string suture around the cervix is carried out, on the sedated mare, restrained in stocks, up to eight months gestation.

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